

June 25, 2015

Julie Saare-Edmonds
Senior Environmental Scientist
Department of Water Resources
1416 9th Street
Sacramento, CA 95814

Re: Model Water Efficient Landscape Ordinance Update 2015

Dear Ms. Saare-Edmunds,

In 1998, our family began Aqua Conserve which became one of the first manufacturers of residential and commercial weather-based irrigation controllers. Aqua Conserve applied for and obtained many patents in the space of irrigation efficiency and technology. Although Aqua Conserve has since ceased operations, we share this so you understand saving water is an important goal to our family and our business.

With this in mind, I have several comments regarding the draft updated Ordinance:

Targeting of Turf

Although recognizing the difference between Warm Season and Cool Season Turf in the Definitions section, the updated Ordinance makes no allowance for the difference in water use and lumps all turf into the same categories in 492.6 and 492.7. The WUCOLS plant factor for Warm Season turf is .6 (Moderate) versus .8 (High) for Cool Season turf. To lump all turf types into the same category regardless of Plant Factor is not consistent with the WUCOLS logic.

A search of the WUCOLS database using the query of "Ground Covers" and "Moderate/High Water Use" yields 88 Ground Covers of Moderate Water Use and 12 High Water Use Ground Cover species. None of these Ground Covers are specifically restricted from use in the updated Ordinance even though the irrigation method and water use classification may be similar to turfgrass.

It is important to note some Cool Season and Warm Season turf varieties can be irrigated effectively with underground drip. Hybrid Bermuda grass, St. Augustine and other Warm Season turf varieties in particular have extensive root systems which effectively mine for water in the soil profile. If a site designer or owner prefers turf areas with underground drip, they are precluded from such a choice by the updated Ordinance.

So one must ask: Why differentiate between Ground Covers and Turfgrass when the plant factors and irrigation methods are similar? Governmental agencies are charged by law with pursuing the public good in the least burdensome methods to a specific industry or population. By specifying only Turf in 492.6 and 492.7, the Turfgrass industry is being unfairly targeted in a burdensome manner with related economic consequences. An estimate of the economic impact of this industry would easily exceed \$1 Billion dollars in California.

Drought Tolerance of Warm Season Turf

As seen in Figure 1 of the 2009 UCR publication, "Managing Turfgrass During Drought," Warm Season turf will survive on 20% ETo and thrive on 60% ETo. Warm Season grasses survive with one day per week watering in the summer and no winter watering if not overseeded. By lumping all turf into one category, in the updated Ordinance, the DWR may be depriving the State of California and it's residents of a viable option of saving water AND having functional turf.

Drip Irrigation Efficiency Degrades

It is difficult to achieve the efficiency goals of .85 for residential and .92 for non- residential areas without utilizing drip irrigation extensively. More extensive use of drip irrigation is an apparent intention of the updated Ordinance. Although the design specifications and installation initially may be efficient, drip irrigation systems lose efficiency more quickly than overhead spray systems. Dr. Waller's "To Drip or Not to Drip" indicated many older landscape drip irrigation systems had "an average uniformity of less than 20%." Clogs occur, emitters degrade, and plants grow with no corresponding adjustment in emitters/microsprays. Most homeowners and landscape maintenance crews will not perform regular maintenance needed to maintain drip system efficiency. This is not to say that drip irrigation is bad, just that it is not the panacea it is promoted to be.

Weak Correlation between Turf Area and Water Use

A 2003 California Landscape Contractors Association (CLCA) study "Urban Landscape Water Use and Efficiency in California on 400+ sites," showed little correlation between percentage of ETo applied in irrigation and the percentage of Landscape in Turf (see Figure 3). "The evidence suggests that the conversion from turf to other irrigated plant materials (e.g. shrubs) does not necessarily convert into lower water use given current (inefficient) water management practices."

Thus, the CLCA study supported the statement of Doug Welsh, Ph. D., past president of the National Xeriscape Council when he stated "The type of plant materials or irrigation system in the landscape has much less effect on water consumption than the human factor of good landscape water management."

Sincerely,

John Addink, PhD Irrigation Engineering
Joel Addink
Aqua Conserve, Inc./A-G Sod Farms, Inc.